UNITED STATES DEPARTMENT OF AGRICULTURE
Bureau of Entomology and Plant Quarantine

SUMMARY OF COOPERATIVE GRASSHOPPER EGG SURVEY

Fall of 1938

During July 1938, major flights of Melanoplus mexicanus, the largest in recent history, occurred in the Northern Great Plains area. These developed from large reservoirs of this species which hatched out in numbers of 1,000 to 10,000 per square yard in idle and weedy range lands adjacent to cropped fields. These reservoirs were located in large areas of North Central South Dakota east of the Missouri River, which ran northward into North Dakota and thence diagonally north westward across that State and in other areas in the southwestern part of North Dakota.

The flights were to the Northeast, North, and Northwest, and Southwest, infesting new territory in the Red River Valley of Minnesota and North Dakota, parts of northern North Dakota, a reinfestation in the Mandan to Dickinson area of that same State, the eastern half of Montana which had no serious infestation to begin with, a large part of the extreme eastern part of Wyoming, and the Black Hills area of western South Dakota respectively.

These flights were not prevented by control measures largely because of two things. First, that farmers are loathe to poison grasshoppers on any land other than that belonging to them. Second, there was a lack of man-power to get the bait spread fast enough to keep ahead of the development of the infestations.

On the western plains, Dissosteria longipennis moved out to the more eastern and southeastern plains area of Colorado, spread over a wider area in the Panhandle of Texas, remained in about the same general area in northeastern New Mexico, and occurred also in the extreme northwestern third of the most western county in the Panhandle of Oklahoma.

Effect of Rains on the 1938 Grasshopper Populations.--The tons of bait estimated as needed for grasshopper control in 1939 are summarized in tabular form by States and special problems.

Surveys conducted on the same basis as in the Fall of 1937 indicate that the potential grasshopper outbreaks in certain States or parts of States have been reduced by seasonal rains. In Iowa the potential is one-half of what it was last Fall, and in Missouri, one-third. With a combination of poisoned bait campaigns and weather working against the hoppers, this potential is now one-half in Oklahoma, two-thirds in Kansas, one-half in Wisconsin, and lowered in Michigan, Nebraska, and Oregon. Direct observations throughout the season showed definitely that areas of heavy egg deposition in Iowa, Missouri, and the eastern part of both Nebraska and Kansas, and elsewhere did not develop heavy nymphal populations because of the effects of continued rains.

Reasons for Increased Bait Needs in Parts of the Area.--In Minnesota, flights of M. mexicanus moved into the Red River Valley, which was comparatively lightly infested at the beginning of the season. Parts of North Dakota were reinfested by the flights after the local outbreaks had been satisfactorily dealt with. In eastern Montana, regions of comparatively light infestations were seriously affected by the migrations of mexicanus. This is also true for eastern Wyoming and the extreme western part of South Dakota. All of which has added to the quantities of bait needed for control in these areas.

In States having large acreages of so-called idleland, much more of this has been included in the calculations this year because of more accurate figures for these acreages and better surveys of this type of land from the standpoint of sources of grasshopper infestations. This has been considered as a separate and additional item for bait estimates for Montana, North Dakota, South Dakota, and Wyoming. Areas of rangeland in these four States severely and very severely infested with mexicanus in the vicinity of crop lands have also been considered separately and additionally to calculations made in the Fall of 1937. All of which has added materially to what our estimates of bait needs would have been had we included in our calculations only those acreages used in 1937.

In spite of a reported 70 to 90 percent reduction in population by control measures of D. longipennis in that area, the problem remains about the same and even greater in Texas. This is due to the great fecundity of grasshoppers in general, and also to the fact (and this applies to all the species in all the areas), that there has been an almost unbroken favorable egg-laying period this fall, up into November. Melanoplus differentialis and M. bivittatus are building up again in eastern South Dakota, and this accounts in part for additional needs for bait in that State where the mexicanus problem has been greatly reduced. Over the entire area, it may be said that the infestations for next year, 1939, will not be as severe as in 1938. Egg predators have already reduced the good egg pods 25 to 75 percent in much of the mexicanus area. Control measures where 90 percent kills were reported have been of material help. These, together with rains, have reduced the potential for the entire area.

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Reasons for increased bale needs in parts of [illegible]

[illegible] in Mexicans moved into the Rio Grande Valley, [illegible] comparatively lightly infested at the beginning of [illegible]. Farms of Texas were reinforced by [illegible] from [illegible] and been entirely [illegible]. In [illegible], [illegible] of comparatively light infestations [illegible] regions of Mexicans. This is also true [illegible] extreme western part of South Texas. [illegible] conditions of bill needed for [illegible].

In Sinaloa having [illegible] bale [illegible] do this and been included in [illegible] resources figured for bales [illegible] land from the standpoint of [illegible] has been considered [illegible] for [illegible] Mexicans, North Sonora, Sonora Delta, [illegible] found in these four states [illegible] marketed in the vicinity of [illegible] separately and additionally [illegible] bill of sales [illegible] which have been made [illegible] made in 1937.

In spite of a reduction of 50 [illegible] in production by control measures of [illegible] in the [illegible] about the area and even [illegible] in Texas. [illegible] Commodity or [illegible] in [illegible], [illegible] applies to all the species in all the areas, it seems [illegible] almost unknown favorable [illegible] price this fall, up into November. Although differentially [illegible] made [illegible] in [illegible] South Dakota, and still recently in part for [illegible] made for bait in that state where the [illegible] problem has been [illegible] reduced. Over the entire area, it may be said that the [illegible] for next year, 1938, will not be as severe as in 1936. The predators have already reduced the egg pods 85 to 90 percent in much of the Mexicans area. Control measures where 50 percent kill were reported have been of [illegible] help. Change, together with [illegible] have reduced the potential for the entire area.

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TONS OF BAIT ESTIMATED AS NEEDED FOR GRASSHOPPER CONTROL IN 1939

STATES	TONS BAIT ESTIMATED FOR 1938	BAIT ESTIMATED NEEDED FOR 1939								TOTAL
		CROP AND IDLELAND		IDELAND	M. MEXICANUS RANGELAND		D. LONGIPENNIS RANGELAND			
		Bait Acres	Tons	Tons Bait	Bait Acres	Tons	Acres Infested	Tons		
Arizona	205	(No survey by Minneapolis Office)								
Arkansas	940	177,000	885							885
California	140	(No survey by Minneapolis Office)								
Colorado	10,152	1,082,077	5,406				4,572,560	14,860		20,266
Idaho	410	218,241	1,087							1,087
Illinois	2,038	410,187	2,050							2,050
Iowa	21,052	2,495,981	12,480							12,480
Kansas	6,643	958,266	4,779							4,779
Michigan	1,656	290,864	1,455							1,455
Minnesota	8,390	2,646,802	13,237							13,237
Missouri	8,534	512,871	2,564							2,564
Montana	5,018	2,103,463	7,837*	2,680	3,489,688	8,724				19,241
Nebraska	15,736	2,745,315	13,730							13,730
Nevada	72	110,992	556							556
New Mexico	2,178	5,232	28				2,467,640	8,021		8,049
North Dakota	38,369	8,198,395	34,458*	6,533	935,875	2,340				43,331
Oklahoma	4,052	392,674	1,963				50,000	162		2,125
Oregon	314	45,600	236							236
South Dakota	25,642	5,575,417	24,040*	3,846	604,523	1,511				29,397
Texas	14,000	910,045	4,549				4,127,000	13,428		17,977
Utah	706	111,547	555							555
Washington	200	265,901	1,331							1,331
Wisconsin	9,945	933,839	4,671							4,671
Wyoming	2,019	693,886	2,672*	794	1,109,749	2,774				6,240
TOTALS	178,411	30,884,595	140,569	13,853	6,139,835	15,349	11,217,200	36,471		

Number of tons of bait estimated as needed for entire area.....206,242

* Idleland considered separately in Montana, North Dakota, South Dakota, and Wyoming.

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ESTIMATED COSTS for 1939

Total tons of bait estimated for 1939 (survey).....	206,242 T.
Less bait-tons of materials on hand (estimated).....	55,000 T.
Tons of bait to be purchased 1939 (estimated).....	151,242 T.

Cost of purchase and delivery of 151,242 tons of bait at $15 per ton (estimated).....	$2,268,630
Storage and mixing of bait; administration and general supervision.....	824,000
Total estimated cost (excluding control of migratorial species).....	$3,092,630
Estimated cost of control of migratorial species in certain areas.....	1,619,917
GRAND TOTAL COST	$4,712,547

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